DB Name	Query	Hit Count	Set Name
USPT	5870080[uref]	1	L18
USPT	l14 and (wireless)	3	L17
USPT	l14 and (wireless or radio or rf)	8	L16
USPT	l14 and(wireless or radio or rf)	8	L15
USPT	usb near20 transceiver	13	L14
USPT	5825873[uref]	1	L13
USPT	serial bus near25 wireless	7	L12
USPT	sertial bus near25 wireless	0	L11
USPT	l9.ti.	3	L10
USPT	wireless near25 serial	315	L9
USPT	wireless near25 usb	4	L8
USPT	5890015[uref]	1	L7
USPT	5825873[uref]	1	L6
USPT	wireless near15 usb	4	L5
USPT	5958020.PN. AND WIRELESS	0	L4
USPT	5717762.dwku.	1	L3
USPT	5812625.dwku.	1	L2
USPT	5890015	2	L1

Entry 4 of 8 File: USPT Feb 9, 1999

DOCUMENT-IDENTIFIER: US 5870080 A
TITLE: Electro-magnetic transceiver combined with a pointing device

BSPR:
Besides being bulky, cables also limit the maximum distance the peripherals may be located from the computer. Peripheral manufacturers have addressed these problems by communicating commands and data through electro-magnetic (EM) pulses which do not require any type of physical connection between the peripheral and the computer. Electro-magnetic communication requires two electronic circuits. The first, called an EM transmitter, converts electrical signals into EM pulses and broadcasts the EM pulses into the atmosphere. A corresponding electronic circuit, called an EM receiver, collects the pulses and converts them back into electrical signals. In theory, EM communication could use infrared (IR) light, radio frequency (RF) waves, or any other portion of the electro-magnetic spectrum. As a practical matter, however, only IR and RF are suitable for computer communication without causing or being impeded by interference from other radiation sources. Most manufacturers have chosen to implement EM technology using IR but the following discussion applies to RF as well.

BSPR:
The configuration of other embodiments depend on the type of EM pulses used. In one alternate embodiment, the EM pulses are infrared (IR) light and the sensor/emitter is positioned on the outside of the pointing device housing to collect and broadcast the IR pulses. A further embodiment using IR pulses comprises a transceiver compatible with the Infrared Data Association standard to allow a single transceiver to communication with multiple IRDA compatible devices. In another alternate embodiment, the EM pulses are RF waves and the sensor/emitter is a small antenna positioned on the outside of the housing. In a further alternate embodiment using RF pulses, the antenna is placed inside the housing. And in a still further embodiment using RF pulses, the antenna is incorporated into the cable by having the cable itself serve at the antenna or through an antenna lead woven into the cable sheathing.

BSPR:
In another group of embodiments, the connection between the EM

transceiver and the computer differs. In one alternate embodiment, the pointing device is configured to connect to a computer equipped with an intelligent serial I/O bus designed to the Universal Serial Bus (USB) specifications. The pointing device and the transceiver are USB compatible circuits having the ability to identify themselves to the USB compatible bus and are coupled to it through a USB port (called a "hub"). The USB compatible bus translates the device identification into a code the computer's processor recognizes as a device address. Because of the intelligence embedded in each device and in the USB compatible bus, a single I/O channel from the pointing device to the USB hub services both the pointing device and transceiver circuits. Furthermore, using USB compatible devices allows the invention to take advantage of the 4 MB transfer rates provided under the USB specification thus speeding the data flow to and from the computer.

DEPR:
As will be readily apparent to those skilled in the art, the electro-magnetic (EM) communication link between the computer and peripheral can be implemented in many different ways. A bi-directional link is shown in FIG. 1 but a uni-directional link, where only the computer sends commands and data to the peripheral, is a further embodiment of the present invention. A mouse is shown in FIG. 1 as the pointing device but track balls, digitizers, joysticks, light pens, or other similar devices are alternate embodiments. While FIG. 1 illustrates the invention using a printer, the use of other similarly equipped peripheral devices will be apparent to those skilled in the art. Electro-magnetic communication can use infrared (IR) light, radio frequency (RF) waves, or any other portion of the electro-magnetic spectrum. One embodiment of the present invention uses IR; another embodiment uses RF. Yet another embodiment uses a transceiver manufactured to the IR standard proposed by the Infrared Data Association ("IRDA") allowing more than one IRDA compatible peripheral to be controlled by the same transceiver in the pointing device.

DEPR:
FIG. 4 shows a computer 100 equipped with an intelligent serial I/O bus 109 compatible with the Universal Serial Bus (USB) specification currently being reviewed for implementation by several industry vendors. The USB specification is an adaption of existing two-line serial connections and defines a universal connector and a single protocol for all USB compatible devices. The pointing device 133 and the transceiver 131 circuits are USB compatible and capable of identifying themselves to the USB compatible bus. Because of this device identification protocol, the signals from both the pointing device 123 and the transceiver 121 can be sent via a single pair of wires in a USB compatible cable 126 to USB port 111. The device identification logic embedded in the USB compatible bus 109, which is coupled to the USB port 111, determines which device sent the signal and translates the device identification into a device address recognizable to the computer's processor. USB compatible device Manufacturers such as Microsoft and Logitech have announced plans to make devices compatible with the USB specification.

CLPV:
wherein the first and second plurality of wires are bound together into a cable having the first and second I/O port plugs separated out of the cable at one end, the electro-magnetic pulses comprise radio frequency waves, and the sensor/emitter comprises an antenna lead incorporated into the cable.

CLPV:
wherein the electro-magnetic pulses comprise radio frequency waves and the sensor/emitter comprises an antenna lead incorporated into a cable coupling the pointing device circuitry and the electro-magnetic transceiver to the computer.

CLPV:
wherein the first and second plurality of wires are bound together into a cable having the first and second I/O port plugs separated out of the cable at one end, the electro-magnetic pulses comprise radio frequency waves, and the sensor/emitter comprises an antenna lead incorporated into the cable.

CLPV:
wherein the electro-magnetic pulses comprise radio frequency waves and the sensor/emitter comprises an antenna lead incorporated into a cable coupling the pointing device circuitry and the electro-magnetic transceiver to the computer.

CLPV:
an electro-magnetic transceiver positioned within the housing for converting radio frequency waves to and from electrical signals, the transceiver coupled to a second I/O port plug by means of a second plurality of wires, and the second I/O port plug further coupled to a second I/O port on the computer for relaying such electrical signals between the transceiver and the processor,

CLPV:
wherein the first and second plurality of wires are bound together into a cable having the first and second I/O port plugs separated out of the cable at one end, and an antenna lead is incorporated into the cable and functions as a sensor/emitter for sending and receiving radio frequency waves intended for further peripheral devices.

CLPV:
an electro-magnetic transceiver positioned within the housing for converting radio frequency waves to and from electrical signals, the transceiver coupled to the cable for relaying such electrical signals between the transceiver and the processor,

CLPV:
wherein an antenna is lead incorporated into the cable and functions as a sensor/emitter for sending and receiving radio

frequency waves intended for further peripheral devices.

CLPV:
an electro-magnetic transceiver positioned within the housing for converting radio frequency waves to and from electrical signals, the transceiver coupled to a second I/O port plug by means of a second plurality of wires and the second I/O port plug further coupled to a second one of the plurality of I/O ports for relaying the electrical signals between the transceiver and the processor,

CLPV:
wherein the first and second plurality of wires are bound together into a cable having the first and second I/O port plugs separated out of the cable at one end, and an antenna lead is incorporated into the cable and functions as a sensor/emitter for sending and receiving radio frequency waves between the transceiver and devices having corresponding sensor/emitters.

CLPV:
an electro-magnetic transceiver positioned within the housing for converting radio frequency waves to and from electrical signals, the transceiver coupled to the cable for relaying the electrical signals between the transceiver and the processor,

CLPV:
wherein an antenna lead is incorporated into the cable and functions as a sensor/emitter for sending and receiving radio frequency waves between the transceiver and devices having corresponding sensor/emitters.

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Entry 2 of 13 File: USPT Nov 23, 1999

DOCUMENT-IDENTIFIER: US 5991546 A
TITLE: System and method for interfacing manually controllable input devices to a universal computer bus system

DEPR:
Several conventional circuit elements that need not be described in detail are incorporated in the interface 20. These include a PS/2 Universal Synchronous/Asynchronous Receiver Transmitter (USART) 34, for serial to parallel conversion of signals from the mouse device 12, for buffering, and for parallel to serial conversion of signals to the mouse device 12. They also include a assembler circuits 37 comprising a Serial Interface Engine (SIE) logic circuit 36 for communicating identification, synchronization, handshake, and configuration data with the USB 14 via a USB slow speed transceiver 38. In the illustrated embodiment, a internal clock generator 40 is used in synchronizing the microprocessor 22, SIE logic circuit 36, and USB slow-speed transceiver 38.

CLPR:
39. The interface of claim 38, further comprising a peripheral device scanner, comprising a peripheral device transceiver communicatively coupleable to a USB-incompliant peripheral device and a peripheral device engine for providing communications between the processor and the peripheral device transceiver.

CLPV:
a processor, communicatively coupleable to a user-configurable memory via a user-configurable memory interface, and a USB-compliant device via a USB transceiver, wherein the user configurable memory comprises a configuration table storing data defining interface parameters for the USB-compliant device and a USB-incompliant device;